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affections, and capable of propagation by inoculation. Whooping-cough may be an exception so far as eruptions and glandular affections are concerned.

2. I have not the least doubt of the communicability of scarlet-fever. I know that it can be propagated by *fomites*. Diseases that can be communicated and transmitted by *fomites* are absolutely contagious: this is self-evident, and cannot be disputed with any show of reason.

3. I know a remarkable instance of the communicability of scarlet-fever by things. It occurred in my own family, living more than two thousand yards from any infected place. The subjects of it got the disease from the clothes of a person who had visited a house in which there were two or more cases.

4. I have no information touching bovine virus.

5. I have known children who had had scarlet-fever, a week after the process of desquamation had been completed, and after anti-septic baths, and their clothes and house environments had been subjected to a disinfecting process, to return to school, and mingle freely with other pupils without communicating the disease to any one. Some writers in the medical journals express the opinion that from four to six weeks should be allowed to elapse before those who have recently had scarlet-fever be permitted to have free intercourse.

6. This question is answered in Paragraphs 1 and 3.

7. I have no experience with regard to the length of time the infection of scarlet-fever may be retained in any articles, but authors will be referred to when Question 14 is under consideration.

8. Boards of health should be empowered by legislative enactments in every State to enforce physicians, and the laity also,—every citizen who may know of a case, or even a 'suspicious case,' anywhere in his vicinity, or indeed in any place from which the disease might be introduced,—to report without delay to the proper authorities.

9. The duty of boards of health and others in authority is to act promptly on receipt of the report of the first case of scarlet-fever, and enforce isolation and disinfection rigorously; and it should be made incumbent on the attending physician to change his clothes, and bathe, etc., before visiting other houses not infected. I have known the morbid principle, both of small-pox and yellow-fever, to be carried in men's beards, and communicated to their wives and children. Indeed, the *materies morbi*, or germs of all contagious diseases, can be transmitted from place to place by any thing capable of absorbing, or holding adherent to it, any substance, dead or living, whether in a solid, fluid, or gaseous form.

10. Besides what I have already indicated in answer to Question 9, I know of no other plan of preventing the spread of scarlet-fever except inoculation and the administration of small doses of belladonna, which should be considered as only a small part of the plan already indicated.

12. As just stated in answer to Question 9, I should state that I gave belladonna to three children for whooping-cough, living in the same house, situated in the very heart of a district infected with scarlet-fever, which was epidemic, and whose parents communicated freely with persons who had the disease, and every one of them escaped.

13. Touching the questions stated in your circular, I can give no further evidence of importance as the result of my own personal observations, but refer to the following authorities, which I have selected from many others in my library: viz., Watson's 'Practice of Medicine' (American edition, edited by Dr. Francis Condie), p. 1180; Ziemssen's 'Cyclopædia of the Practice of Medicine,' vol. ii. pp. 161 *et seq.*; Aitken's 'Science and Practice of Medicine,' 6th edition, vol. i. p. 480.

Scarlet-fever, in my opinion, is certainly amenable to control by proper sanitary measures under ordinary circumstances; but if a case occurs in a town or city where there exists a certain condition of the atmosphere, or certain meteorological states of the air (of which we know very little, and which has been significantly termed 'epidemic constitution of the air'), spreading diseases will extend *per se* through it as a medium. Yellow-fever does this, and travels about forty feet a day, and thus, by the concurrent existence of a line of personal communication, spreads over a city and its suburbs, and even beyond. Small-pox has been known to spread

from certain centres (hospitals, for example) for over one thousand yards. It is shown lately (see *The American Journal of the Medical Sciences* for July, 1887, p. 300) by the 'Report of the Local Government Board of England' that from small-pox hospitals the *materies morbi* of *variola* will travel *per se* through the air to the extent of at least half a mile.

I would refer you to the *Medical News*, Nov. 26, 1887, p. 627, for a short but excellent paper on the contagion of scarlet-fever. From its tenor the contagious nature of scarlet-fever is admitted, but it is assumed that it is caused by a germ or living organism which has not been shown to exist. I am one of a small minority among the medical profession who cannot accept the germ theory of disease. Germs of microscopical organisms may, nay, no doubt do, carry contagion, but have no etiological relations as to the primary cause, or *causa causans*, of contagious diseases; and I say this in spite of my familiarity with the literature of the subject,—the latest experiments of Pasteur, Koch-Klein, Edington, Jamieson, Dale, Unger, and others are right now in arm's reach of me, and have been carefully read by me, several for the third time,—I cannot yet accept the germ theory of disease.

[G. C. ASHMAN, M.D., Cleveland, O., health-officer.]

1. I do not. But I think it possible, and even probable, that some of the lower animals have scarlatina, or a disease of which scarlatina in man is a modification.

2. None whatever.

3. (a) An instance where clothing worn by children having the disease in January was brought into another family the following April, cases occurring within ten days thereafter; (b) an instance of school-books used in a family suffering from scarlatina in June, upon being opened and used by other children the following September, appeared to cause the disease; (c) a large number of instances where physicians and others coming in contact with cases have appeared to carry a germ of disease to their own or other families.

4. None.

5. I do not know. My observation leads me to the conclusion that the disease is communicable at any stage after fever begins, and at least until desquamation is completed; and this last stage is often very prolonged.

6. As in No. 3.

7. Three to four months.

8. Most certainly. By the physician or other person making diagnosis. For the prevention of extension, thereby saving life and health. As it is a disease of childhood chiefly, prompt notification of school authorities enables them to exclude infected or infectious children from schools. A placard upon the infected house notifies all who are about to enter of the nature of danger to which they are exposed. It educates the people, and favors isolation.

9. To notify the public of danger, and to render the infected such assistance as may be necessary; to have, if possible, a hospital to which all cases not otherwise isolated should be removed promptly; to give information as to the nature and prevention of the disease.

10. Yes, prompt and complete isolation of every case.

11. An instance of a child in a family of four, none of whom had the disease; the child affected at once isolated in the same house; the skin in every part washed twice a day with a solution of murcuric chloride (1 to 1,000), and all secretions and excretions treated by the same solution; the isolation maintained for nine weeks; no communication in any way.

12. Yes, in a measure. I believe there is in every individual a natural resistance to diseases, varying in individuals and the same individual at different times, and in respect to certain diseases. This natural resistance is at its best when all bodily functions are best performed.

13. Text-books can do it better.

[To be continued.]

BOOK - REVIEWS.

Higher Grounds. Hints toward settling the Labor Troubles. By AUGUSTUS JACOBSON. Chicago, McClurg & Co. 16°. \$1.

THIS is a small book, as books go nowadays, for it may easily be read through at a sitting. But it demands comment out of

all proportion to its size, for it is both original and powerful. The author's style is clear, crisp, and concise, and, as we shall show by some quotations, is very striking and attractive. Take this as a specimen: "Everybody wants to settle the labor question, but nobody is willing to sacrifice any thing to settle it; nobody appears to be willing to pay out any money to settle it. The labor question will not be settled without sacrifice; it will not be settled without a large expenditure of money. To settle the labor question without sacrifice, would be to get something for nothing. The settlement of the labor question will in some way have to be paid for." The one hundred and sixty pages of the book are full of just such epigrammatic passages as that.

Mr. Jacobson's line of argument is this. The so-called labor problem is the great problem, not only of our time, but of all times. It cannot be settled without expense, and large expense at that. Although any thing but settled, it has already cost this country hundreds of millions of dollars in the way of disturbance of business. The demand of the man who is at the bottom for better things in life is in the nature of things. It is a demand which sooner or later must be met, and it is to the interest of every one that it should be met. The man who works with his hands sells by the quantity, and at the lowest possible prices, all he produces. Whatever he has to buy he buys at the highest retail price. In the game of life the cards are stocked against the man who labors with his hands. Nearly all the wealth of modern times is earned by steam, which does for man his work. The wealth which steam earns should belong to all mankind; but, instead of going to the many, it goes to the few, and the many continue to hopelessly drudge and slave on. But the labor question is not merely a question of fewer hours and more pay: it goes deeper than that. It can be settled, but it can be settled by nothing short of revolution. This revolution, however, will be peaceful: there will be no lawlessness, no destruction of property, nobody would be maimed, nobody would be killed. The revolution is to be effected through the manual-training school.

In June, 1886, the Chicago Manual-Training School sent an entirely new product into the world. It graduated a class of boys about eighteen years of age, who three years before had never touched tools with a view to becoming skilled in their use. Yet, without neglecting their books, they had in those three years drawn the plans for several steam-engines, had made the patterns in wood, had done the chipping, filing, and lathe-work (the casting was done elsewhere, because the school lacked facilities for doing it), had put together the engines, and had run them. This manual education was not special, but general. It mattered not what profession the boys chose: it was useful to them. The product of the manual-training school does not compete with the wage-earning masses, for his skill and intelligence raise him above them. The manual-training school is popular, and destined to become still more so; for at the present time the school facilities that exist for the children of the laboring people, after they are ten or twelve years old, are only a hollow mockery. The manual-training school should become part of the American school system; and, to enable all children to get the benefit of the school, parents or guardians should be paid for keeping the children at school. The compensation should begin at the child's twelfth year, and be fifty dollars per year: it should continue till his twentieth year, when it should be three hundred dollars a year. The proposition includes both boys and girls. The expense thus incurred would be enormous, and could not be met by any taxation now in vogue. It could be met, however, by a graduated tax upon estates. In war times we had a succession tax, and it never failed to be collected, simply because the probate judge could declare no estate settled until the tax had been paid. The law imposing this tax was passed in 1861, and amended in 1862. Both acts were signed by Abraham Lincoln. In war times we also had a graduated income tax; so that a graduated tax is not new to the American people. But the income tax was odious, because only the scrupulous paid, and the unscrupulous escaped by swearing falsely. A succession tax is a fair tax, because nobody can escape paying it. The State of New York has a graduated succession tax, passed by the Legislature of 1885. It is now proposed to enact a graduated tax for all estates. It should be $\frac{1}{4}$ per cent on estates less than \$25,000, $\frac{1}{2}$ per cent on all above

\$25,000 and less than \$50,000, $\frac{1}{4}$ per cent on all above \$50,000 and less than \$100,000, then increasing gradually until it becomes 10 per cent on estates above a million, and 50 per cent on estates above five millions. The tax would not fall heavily upon anybody. It would only be \$2.50 on an estate of \$1,000, and only \$1,000 on an estate of \$100,000. It would yield from twenty-five to fifty millions annually in New York City, and from three to six millions annually in Chicago. Its proceeds would be ample for the proposed expenditure. This measure is expedient, and as just as any tax measure can be. It would increase individual power and individual intelligence, and would produce no unhappiness or suffering. The very rich man might say that he should be permitted to do what he likes with his own; but this he cannot do now, and in the nature of things will never be allowed to do. The law interferes at every step, and tells him what he may do with his own, and what he must not do. Many rich men give as much now for benevolent objects as the succession tax would take from their estates; but they rarely give it so as to accomplish the most good. Untold benefits would arise from this law. The child-labor problem would be settled, because it would now pay to keep the children at school. Wages would rise, because the competition of thousands under twenty years of age, who are now laborers, would be withdrawn. Intelligence shall make the people strong, the people shall be the government, and the strength of the people shall be the strength of the government. This is, in briefest outline, Mr. Jacobson's argument. Its novelty, its brilliancy, and its apparent cogency, nobody will deny; but will it stand the test of practicability? We are compelled to ask this question seriously, because Mr. Jacobson's proposition is made thoughtfully and in good faith: it is not the vagary of a fanatic, or the raving of a lunatic. It is a business proposition, and as such it demands fair treatment.

The second half of Mr. Jacobson's book is devoted to an explanation and eulogy of the manual-training school. We will grant for the sake of argument — though we agree with Mr. Jacobson in the matter, and therefore really grant nothing — that the manual-training school will accomplish all that is claimed for it by its thoughtful and influential advocates. It is then necessary to consider obvious objections to Mr. Jacobson's plan. So far as the graduated tax on estates is concerned, it is an excellent, safe, and easily collected tax. And while it may at first sight seem absurd to talk about subsidizing parents to keep children at school, yet we must take other considerations into account. It is just as absurd, and no more so, to levy a school-tax upon a man who has no children to be educated. Furthermore, it is an expense incurred in order to solve the labor question, which Mr. Jacobson holds, and rightly, cannot be solved without sacrifice and expense. All this being acceded to, it remains to ask whether the proposed tax would pay the bill. The author claims that it would, but offers no statistics in support of his assertion. An examination of the census of 1880 may enlighten us. Mr. Jacobson proposes to pay certain fixed sums per annum for each child over twelve and under twenty. In 1880 there were 8,347,731 such children in the country. To be reasonably successful, Mr. Jacobson's plan should reach at least three-fourths of them. If it should reach so many, and payments were made at the rates laid down by the author, the disbursements under this head in 1880 would have amounted to the enormous sum of \$919,502,737.50, or nine times more than our present total outlay for educational purposes. In the census year there died 756,893 persons. Of these, 202,806 were children under five years of age, whose opportunities of accumulating fortunes were restricted. But let us suppose that one-half of all those who died, or 378,447 persons, left estates valued at \$1,000 and over (we are construing these figures in as liberal a spirit as possible toward Mr. Jacobson, and if we err it is not against his theory). Suppose now, and it is almost unreasonable to suppose so, that 370,000 of these left fortunes averaging \$5,000, that 8,000 left fortunes averaging \$25,000, that 400 left fortunes averaging \$100,000, and that 47 left fortunes averaging \$1,000,000. If Mr. Jacobson's graduated succession tax were levied on these estates, it would net \$10,830,585, making no deduction for cost of collection. And this \$10,830,585 seems paltry when brought face to face with \$919,502,737.50. Mr. Jacobson claims, however (p. 44), as was quoted above, that the tax would at present yield from three to six millions annually in Chicago, and from twenty-five to fifty

millions annually in New York City. We cannot understand on what he bases that assertion. Take the two cities separately. The Illinois counties of Cook and Lake, that in which Chicago is situated and its neighbor on the north, lost 11,433 inhabitants by death in 1880. Of these, 6,230 were infants under five. If, of the remaining 5,203, 5,000 had died with average estates of \$5,000, 175 with \$100,000, and 28 with \$1,000,000, — a most preposterous assumption, — then in those two counties Mr. Jacobson's tax would have netted \$3,075,000. But the conditions are impossible. It is the same with New York. In 1880, New York and six adjoining counties had 25,239 deaths of persons over five years of age. Making an assumption regarding their estates as preposterous as that made in the case of Chicago, the return from Mr. Jacobson's tax would have been less than \$7,000,000.

Two things are very evident, — first, that Mr. Jacobson made no estimate of what his plan would cost; second, that he very much overestimates the number of fortunes of \$20,000,000 and over, in this country. His tax is 50 per cent on fortunes of \$5,000,000 and over, to be sure; and, if a few persons possessing that sum were to die at once, the return would be far greater than we have estimated. But such persons do not all die at once, and moreover, in the long-run, our overestimate of the number of millionaires would suffice to make up the sum their deaths would contribute. It might even happen that Mr. Jacobson's estimate of the number of immense fortunes is approximately true: the amount raised by the tax would still be far short of the necessary expenditure. The plan is a brilliant one. It has many excellent points. We admire its author's enthusiasm for the manual-training school. His suggestion as to a graduated tax on estates commends itself to our judgment. But as a plan to solve the labor problem, it will not work. This is partly because the income under the plan would not pay the expenditure, and partly because the labor problem is, in many respects, the problem of human nature. In Mr. Jacobson's sense of the word "solution," it cannot be solved.

NOTES AND NEWS.

THE annual meeting of the Association of the Colleges of Ohio will be held at Athens, Dec. 26, 27, and 28, 1887. The following is a list of the papers expected: Monday, Dec. 26, opening address, by Pres. Eli T. Tappan, commissioner of common schools. Tuesday, Dec. 27, 'The Aim of the College,' by Prof. C. L. Ehrenfeld, Wittenberg College; 'Rhetorical Studies and Literary Work in College,' by Prof. W. B. Chamberlain, Oberlin College; 'The Claims of Classical Archaeology on Classical Teachers,' by Prof. B. Perrin, Adelbert College; 'Geology and Mineralogy in our Colleges,' by Prof. J. F. James, Miami University; Symposium, 'The Elective System with Us, What we Do and What we Think,' by the presidents or other representatives of all the institutions in the association. Wednesday, Dec. 28, 'Preparation for College in Ohio,' by Prof. Charles Chandler, Denison University. Meetings of the association will be held in the chapel of the Ohio University; entertainment at the Central Hotel, at \$1.50 per day, and at the Warren House at \$2 or less, according to the number stopping there. Trains leave Columbus for Athens at 7.45 A.M., 3.10 P.M., and 6.10 P.M., standard time.

— A literary and musical entertainment was given at the residence of Mr. and Mrs. H. Herrman in New York on Wednesday evening, Dec. 7, in aid of the Erminnie A. Smith memorial prize fund at Vassar College. The evening was a very enjoyable one, there being two hundred and fifty persons present, and a fine collection being furnished by Mrs. Herrman.

— The five lessons on problems in physical geography delivered by Prof. W. M. Davis, under the auspices of the Teachers' School of Science of the Boston Society of Natural History, during the winter of 1886-87, were so novel and useful to teachers, that he has been invited to give a course during the coming winter upon the physical geography of the United States. This course will be in part a continuation of last year's lessons; but the addition of new matter, new models, more extended illustrations, and the special attention given to our own country, will make the lectures practically distinct from those given last winter.

LETTERS TO THE EDITOR.

* * * Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith. Twenty copies of the number containing his communication will be furnished free to any correspondent on request. The editor will be glad to publish any queries consonant with the character of the journal.

Conspiracy of Silence.

THE discussion published in a recent number of your journal (*Science*, x. No. 252), relative to the faith of scientists, is the revival of a topic which seems to have been long since definitely settled. If history can be credited, scientific men in every age have fought vigorously against progress. An interesting example is furnished by a brilliant French novelist, Mr. Paul Féval, and probably few will fail to recognize the truth of the following quotation: —

" Il fallut cependant des années encore pour que ce savant et illustre corps, le marine de l'Etat, voulût bien prendre en considération cette force qui fait reculer le vent et se rit de la violence même des courants. Il est vrai que l'Académie professait, vers le même temps, cette opinion: qu'une vitesse de dix lieues à l'heure, sur un chemin de fer, supprimerait la respiration chez l'homme et tuerait tous les malheureux assez fous pour se livrer à ces folles expériences. Il serait puéril d'accuser notre marine ou nos académies. Le monde est ainsi fait. Tout progrès gêne quelque intérêt ou froisse quelque orgueil.

" Dans le doute, abstiens-toi, disait la sagesse antique; la sagesse moderne répond: *Si tu ne sais pas, empêche!* Fera-t-on jamais le compte des hommes et des idées mis à mort au nom de ce fantôme idiot que les sages nomment *l'invisibilité*?"

The *naïve* confession of Mr. Bonney practically concedes the whole case. Here are two theories of the formation of coral reefs, each dependent upon a certain set of facts, accessible to all investigators. Mr. Bonney says that the scientific method is to wait, and not to investigate. He is not able, he says, to make up his mind which theory is correct. Is this really a scientific method?

The ideal scientist, it will readily be admitted, is a person whose sole aim is to discover the truth of any matter under investigation, regardless of all personal or partisan feelings. The actual man of science, for the reason that he is a man, is influenced, unconsciously it may be, by his human characteristics, and frequently allows prejudice to overcome reason. In the particular case already considered in your columns, it appears that Mr. Murray discovered some facts which were unknown to Darwin, and that, these facts admitted, Darwin's theory must necessarily be modified. This is the precise point which Mr. Bonney adroitly evades: does he believe the facts stated by Mr. Murray; and, if so, can he reasonably continue to accept Darwin's theory? What excuse is there for waiting, unless, indeed, Darwin is an idol whose sayings, because they were made by him, must be received with reverence by all his followers?

This theory of Darwin's is only one of a number of beliefs which scientists uphold with obstinacy, in the face of contrary evidence; but, as is well said by the writer already quoted, —

" Mais, en tout siècle, les sages eurent beau se coucher au travers de la grande route où marche l'humanité, l'humanité passa. L'invisibilité, grotesque épouvantail, recule ses brouillards devant la lumière. Des miracles, déclarés impossibles, se promènent paisiblement dans nos rues. Et tout va vite: voyez! il y a de cela quarante ans à peine; en cherchant bien, vous trouverez certes encore, vivant et grignotant sa brie du budget, quelqu'un de ces Spartiates dont la main tremblante essaya d'arrêter la vapeur!"

It may be of interest to glance briefly at another celebrated theory, which has been treated by scientists in a manner very similar to that pursued in the case of coral formations. About the year 1844, Messrs. Favre and Silbermann experimented on the heat evolved by the combustion of certain elementary and a few compound combustibles. Their experiments, far surpassing in accuracy all those hitherto made, were accepted by scientific men generally, and their results are given in most text-books and treatises on heat. These distinguished experimenters did not think it necessary to test the heating-power of the familiar compound, coal, but considered that it could be calculated with sufficient accuracy by analyzing the coal, and assuming that the heating-power was the same as the sum of the heating-powers determined for the various combustible elements, less the unavailable heat of so much of the